

PAT-NO: JP401230478A  
DOCUMENT-IDENTIFIER: JP 01230478 A  
TITLE: HOMOGENEOUS SINTERED SILICON NITRIDE  
AND PRODUCTION THEREOF

PUBN-DATE: September 13, 1989

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APPL-NO: JP63044001

APPL-DATE: February 26, 1988

INT-CL (IPC): C04B035/58

ABSTRACT:

PURPOSE: To obtain a uniform and high-strength sintered silicon nitride, by mixing, pulverizing, granulating and forming a silicon nitride raw material and a sintering assistant, calcining the formed article and cooling at a specific cooling rate.

CONSTITUTION: A silicon nitride raw material and a sintering assistant are mixed, pulverized, granulated and formed, and the obtained formed article is calcined to obtain a sintered silicon nitride. In the above process, the

in the atmosphere  
under 1-2 atm pressure and held at 1,400-1,600°C  
preferably for 0.5-2 hr  
until it is made substantially free from open pores. In  
the 2nd stage, the  
pressure of the atmosphere is increased to  $\geq 30$  atm and  
the green compact is  
held at 1,400-1,600°C preferably for 2-5 hr until the  
residual  $\alpha$ -rate  
of the resultant sintered compact attains to 5-35%. The  
sintered compact  
contains 4-10 wt.% (expressed in terms of  
 $\text{Yb}_2\text{O}_3$ )  $\text{Yb}$ , 2-5 wt.%  
(expressed in terms of  $\text{MgO}$ )  $\text{Mg}$  and 0.5-4 wt.% (expressed in  
terms of  
 $\text{Al}_2\text{O}_3$ )  $\text{Al}$  and the weight ratio of  
 $\text{Al}_2\text{O}_3$  to  
 $\text{MgO}$  is  $\leq 1$ .

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